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WPNSSB

PURCHASE DESCRIPTION

MULTIMETER, DIGITAL

MU2JM-H

1. GENERAL. This procurement requires a portable 4-1/2 digit multimeter.

2. CLASSIFICATION. Type II, Class 5, Style E, and Color R in accordance with MIL-T-28800 for shipboard applications.

3. MEASUREMENT CAPABILITIES. The equipment shall be capable of measuring alternating and direct voltage , alternating and direct current utilizing specific internal series shunt values, and resistance within the minimum measurement ranges and accuracies specified below. The meter shall be average responding and rms indicating in ac modes.

3.1 DC Voltage Measurement.

3.1.1 Measurement Range: 10 mVdc to 1000 Vdc minimum.

3.1.2 Resolution: At the following reference points 100 mV, 1V, 10V, 100V, and 1000V the minimum resolution shall be 0.01 mV, 0.1 mV, 1 mV, 10 mV, and 100 mV respectively.

3.1.3 Accuracy: $\pm$(0.04% reading + 3 counts).

3.1.4 Input Impedance: 10 megohms resistive load.

3.1.5 Normal Mode Rejection Ratio: $\geq$ 60 dB at 50 and 60 Hz.

3.1.6 Common Mode Rejection Ratio: $\geq$ 90 dB with a 1 kilohm unbalanced input.

3.1.7 Input Voltage Protection: 1050V (dc + peak ac).

3.1.8 Common Mode Voltage: 500V (dc + peak ac) referenced to chassis ground.

3.1.9 Temperature Coefficient: $\pm$(0.004% of reading + 0.001% of FS)/°C maximum, outside the range of 18 to 28 C.

3.2 AC Voltage Measurement.

3.2.1 Measurement Range: 100 mVac to 750 Vac minimum.

3.2.2 Frequency Response: 30 Hz to 70 kHz minimum.

3.2.3 Resolution: At the following reference points 100 mV, 1 V, 10 V, 100 V, and 750 V the minimum resolution shall be 0.01 mV, 0.1 mV, 1 mV, 10 mV, and 100 mV respectively.

3.2.4 AC Voltage Accuracy:

Frequency	Range	±(% input + No. of counts)
30 - 50 Hz	all ranges	1.5 + 20
50 - 1000 Hz	all ranges (except maximum range setting)	0.5 + 20
	maximum range setting	1.5 + 20
1 k - 10 kHz	all ranges (except maximum range setting)	0.5 + 20
10 k - 20 kHz *	all ranges (except maximum & minimum range setting)	1.0 + 40
	minimum range setting	1.5 + 40
20 k - 50 kHz *	all ranges (except maximum & minimum range setting)	2.5 + 75
	minimum range setting	8 + 75
50 k - 70 kHz *	all ranges (except maximum & minimum range setting)	5 + 200
	minimum range setting	8 + 200

* Input voltage not to exceed 1X10E7 Volt x Hertz product.

3.2.5 Input Impedance: ≥10 megohms shunted by <100 pF.

3.2.6 Common Mode Rejection Ratio: ≥ 60 dB at 50 and 60 Hz with 1 kilohm unbalance.

3.2.7 Input Voltage Protection: 1050V (dc + peak ac).

3.2.8 Crest Factor: ≥ 3:1.

3.2.9 Common Mode Voltage: 500V (dc + peak ac) referenced to chassis ground.

3.3 Direct Current Measurement.

3.3.1 Measurement Range: 1 uA to 2A minimum.

3.3.2 Resolution: At the following reference points 100 uA, 1 mA, 10 mA, 100 mA, and 1A the minimum resolution shall be 10 nA, 100 nA, 1 uA, 10 uA, 100 uA respectively.

3.3.3 Accuracy: ±(0.2% reading + 15 counts).

3.3.4 Shunt Loads: 900, 90, 9, 0.9, and 0.1 ohms non-inductive internal shunt loads with corresponding ranges.

3.3.5 Input Voltage Protection: 1050V (dc + peak ac).

3.3.6 Input Current Protection: The maximum current input range(s) shall be fused at the maximum rated current.

3.4 Alternating Current Measurement.

3.4.1 Measurement Range: 20 uA to 2 A minimum.

3.4.2 Frequency Response: At least 30 Hz to 30 kHz.

3.4.2 Resolution: At the following reference points 100 uA, 1 mA, 10 mA, 100 mA, and 1A the minimum resolution shall be 10 nA, 100 nA, 1 uA, 10 uA, 100 uA respectively.

3.4.3 Alternating Current Accuracy:

Frequency	Measurement Range	±(% input + No. of counts)
30 - 50 Hz	20 uA to 2 A	1 + 20
50 - 3 kHz	20 uA to 2 A	0.8 + 20
3 k - 10 kHz	20 uA to 300 mA	2.0 + 40
10 k - 30 kHz	20 uA to 20 mA	2.0 + 50

3.4.4 Shunt Loads: 900, 90, 9, 0.9, and 0.1 ohms non-inductive internal shunt loads with corresponding ranges.

3.4.5 Input Voltage Protection: 1050V (dc + peak ac).

3.4.6 Input Current Protection: The maximum current input range(s) shall be fused at the maximum rated current.

3.5 Resistance Measurement.

3.5.1 Measurement Range: 50 ohms to 20 megohms minimum.

3.5.2 Resolution: At the following reference points 100 ohms, 1 kilohm, 10 kilohms, 100 kilohms, 1 megohm, and 10 megohms the minimum resolution shall be 10 milliohms, 100 milliohms, 1 ohm, 10 ohms, 100 ohms, and 1 kilohm respectively.

3.5.3 Accuracy: ±(0.2% + 3 counts).

3.5.4 Open Circuit Voltage: ≤ 5 Vdc.

3.5.5 Short Circuit Current: ≤ 1 mAdc.

3.5.6 Input Voltage Protection: 450 V (dc + peak ac).

3.6 Controls and Displays.

3.6.1 Range Control: The instrument shall be provided with automatic and manual range control for voltage and resistance measurements and manual range control for current measurements.

3.6.2 Display Functions: The instrument shall be provided with an over-range indicator and a battery

condition test or indicator.

3.6.3 Automatic Features: The instrument shall be provided with automatic polarity selection and zeroing as required by each functional mode.

4. GENERAL REQUIREMENTS.

4.1 Power Source. The equipment shall operate from the nominal and internal dc sources as specified in the following paragraphs.

4.1.1 Nominal power: MIL-T-28800 nominal power source requirements are invoked. Maximum power consumption: 20W.

4.1.2 DC internal power: MIL-T-28800 dc internal power source requirements are invoked. A charger and internal batteries are required. Minimum operating time shall be 6 hours following a maximum recharge time of 16 hours. The charger shall operate from the nominal ac power source.

4.2 Lithium Batteries. Per MIL-T-28800, lithium batteries are prohibited without prior authorization. A request for approval for the use of lithium batteries, including those encapsulated in integrated circuits, shall be submitted to the procuring activity at the time of submission of proposals. Approval shall apply only to the specific model proposed.

4.3 Weight. 5 kg (11 lb) maximum.

4.4 Test Leads. The equipment shall be provided with safety-designed banana plug test leads in accordance with MIL-T-28800.

4.5 Digital Interface. The equipment shall be provided with a digital interface in accordance with MIL-T-28800.